A. Restriction Requirement

1. Applicants respectfully wish to alert the Examiner to the fact that the statement in Examiner's Office Action indicating that Applicants had elected without traverse is incorrect. Applicants respectfully restate that election was made with traverse during the telephonic election of April 25, 2003.

2. Applicants respectfully disagree with Examiner's assertion that the collapse system and a display device are different inventions on two grounds.

Firstly, the restricted claims are drawn to the display apparatus that is integral to Applicants' technology, since it evidences the readings of the collapse system. This is further evidenced by the preamble of the restricted claims 8-10 and 44-46 that states "A system for detecting collapse of structures comprising...." The display device, as per the present invention, is therefore limited in scope to those pertaining to use in collapse detection systems. This limitation cannot support the Examiner's assertion that the display device is a separate entity for the purposes of restriction. Thus, no undue burden is placed upon the Examiner to examine these claims.

Secondly, examined claims 11-43 and 47-73 recite the display apparatus. Examination of these claims further supports the Applicants' position that the display device is not a separate invention as alleged by the Examiner in the restriction requirement. It is for these reasons that Applicants respectfully request that the restriction requirement be removed and the restricted claims be examined on their merits.

B. Claim Rejections

The Examiner has rejected claims 1-7, 11-43 and 47-73 as being obvious over U.S. 5,526,694 to McEachern, et al.

1. Examiner asserts that the Applicants' invention is obvious over McEachern, et al., because McEachern, et al., teach an accelerometer for measuring resonant accelerations of a building structure, an amplifier, a filter, and an A-D converter to convert output of the filter. The Examiner further contends that McEachern, et al., also teach a display device, a processor coupled to the accelerometer, a microprocessor and a storage element having battery back up. Additionally, McEachern, et al., as per the Examiner, disclose and claim conversion of time-domain samples from the A-D converter to frequency-domain samples. The Examiner also asserts that the battery disclosed in McEachern, et al., is analogous to the Applicants' second power source. Finally, the Examiner maintains that McEachern, et al.'s, failure to teach a second power source, a transmitter and a receiver are obvious in view of this reference, since "the omission of an element and its function in a combination, where the remaining elements perform the same functions as before, involves only routine skill in the art." (*See* Examiner's Office Action; p. 4 (1st paragraph) May 27, 2003.) The Examiner's rejection is respectfully traversed.

It is important to first note that McEachern, et al., is directed to measuring and recording resonant frequencies over a subsequent period of time to detect hidden structural damage due to wind resonance. (*See* Background of the Invention of '694.) The measurements are comparative in nature, i.e., to "detect changes in pre- and post-trauma structural properties." (*See* Column 2, lines 21-22.) In summary, McEachern, et al., aids in detecting that damage has been done in a before and after comparison, so that the structure can be repaired.

Measuring structural responses to detect for damage, due to ambient conditions such as wind, is not the claimed subject matter of Applicants' present invention. Applicants are directed to the onset, growth and progression of a collapse to its natural conclusion. As stated in the Applicants' detailed description, "Collapse detection ... begins with the assumption that damage is irreversible (emphasis added)." (*See* page 8, lines 7-8 of Applicants' disclosure.) Thus, pre- and post resonance comparative studies, as taught by McEachern, et al., bear no consequence to Applicants' present invention, as Applicants' are concerned with measuring the risk of collapse in real time.

Secondly, it is important to note that all of the devices taught by McEachern, et al., are contained within a single apparatus having a display feature. Since McEachern, et al., are directed to pre- and post resonance damage detection, a single apparatus is critical for comparative resonance measurements. Applicants disclose and claim a two-part collapse detection system where the display means must be located remotely from the accelerometer. The separation of the display apparatus from the accelerometer is critical to the Applicants' claimed invention, since the onset of collapse cannot be measured onsite without serious harm to personnel. It is the precise intention of the Applicants' claimed invention to detect for collapse to allow personnel to be moved from the area of imminent danger. By separating the accelerometer containing apparatus from the display apparatus, a user can quickly attach the accelerometer containing apparatus to the structure at the point of entry and leave the area.

The separation of the display apparatus from the accelerometer necessitates transmission of signals from the first apparatus to the second. The transmitter and receiver, as disclosed and claimed by Applicants, are also critical to the overall system so that accurate signals can be transferred from the onsite device to the remotely located second part of the collapse system.

Additionally, Applicants' device is to be used *during* traumatic events, such as fires, and thus it is imperative to be able to record data at the site of the event and transmit that data to a secondary location out of harm's way.

The Examiner may contend that transmission is an inherent feature of the McEachern, et al., apparatus, since some degree of transmission must occur from the converter to the microprocessor. This point would not convince one of ordinary skill that a transmitter and receiver as disclosed by Applicants are obvious over McEachern, et al., for there is no motivation in McEachern, et al., to provide for a separate and remotely located display apparatus. Thus, the omission of elements from McEachern, et al., as mere routine skill in the art is not supported by McEachern, et al. Were one of ordinary skill in the art to find Applicants' claims obvious over McEachern, et al., one would have to modify the Applicants' present invention to operate as a single apparatus. This would render the Applicants' claimed invention inoperable for the reasons stated above.

Alternatively, there is no motivation for McEachern, et al., to modify their apparatus to operate as a two part system since McEachern, et al.'s, apparatus is attached to the building in a position "near the top of the structure..." to maximize the accelerometer signal (*See* column 3, lines 1-3). This is because McEachern, et al., intends that a user return to the site of the apparatus to obtain readings. Thus, McEachern, et al., are intended for use *over a long period of time*, and there is not the overriding need to keep data interpreters away from the accelerometer site as there is in Applicants' device. A transmitter and receiver are necessary to Applicants' invention as there would be no way for the accelerometer readings to reach the display apparatus. As McEachern, et al., are directed to a very different utility, one of ordinary skill in the art would not be motivated towards such a modification.

2. The Examiner contends that the battery as taught by McEachern, et al., is "equivalent to a second power source" as recited by Applicants. The Examiner also contends that accelerometers having internal power sources are well known. (*See* Examiner's Office Action, page 3.) The Examiner's assertions are respectfully traversed.

Applicants, as experts in the field, contend that accelerometers with internal power sources are not known. Accelerometers require outside power sources. Since McEachern, et al., are silent as to a second power source, it is assumed that the batteries disclosed are the only power source utilized by the device. The collapse mechanism, as disclosed by the Applicants, includes a two-part system as discussed above. As such, each of the parts can utilize its own power source. As discussed during the Examiner's interview, collapse mechanisms occur when building power supply is not operational. At such times, the second power source can be connected to the first power source to supply power to operate the accelerometer. One of ordinary skill would, therefore, have not found it obvious to consider the batteries as disclosed by McEachern, et al., as a secondary power source--McEachern, et al., teach only one power source as they are only directed to a single apparatus for detecting wind resonance.

3. McEachern, et al.'s, disclosure of the devices comprising their apparatus does not and cannot render the Applicants' present invention obvious. Applicants note that McEachern, et al., disclose and claim an accelerometer that measures resonance in the magnitude of 10 Hz and lower. The Examiner contends that this recitation renders the Applicants' claimed invention obvious. Applicants are directed to a range of frequencies from 0 to 30 Hz. It is imperative that the Applicants' claimed device measure near-zero frequencies as well as those above 10 Hz to obtain an accurate reading of the overall collapse mechanism. Note that McEachern, et al.,

eliminate the near-zero frequencies to obtain a cleaner signal. (*See* column 3, lines 49-53.) These near-zero reading are critical to Applicants' claimed invention as "accelerometers that are not capable of monitoring DC responses will filter or attenuate these responses around 4 Hz, and, therefore, be incapable of detecting changing mean accelerations approaching ultimate collapse." (*See* Applicant's detailed description, page 11, lines 18-22 through page 12, lines 1-3.). Note also that McEachern, et al., do not consider frequencies above 10 Hz. (See claim 1 of '694). One of ordinary skill would not have found it obvious to modify the McEachern, et al. apparatus to detect for near-zero frequencies, as McEachern, et al., clearly disclose elimination of these readings. Similarly, one of ordinary skill in the art would not have looked to McEachern, et al., for motivation for measurements in these frequency ranges, as they are not useful for breeze-generated resonance. Note that McEachern, et al., distinguish their apparatus for measuring wind accelerations as opposed to "strong winds and hurricanes." (*See* column 2, lines 5-7.)

It is for this very reason that McEachern, et al., disclose but not claim an amplifier. An amplifier is critical to the Applicant's claimed invention to enhance the overall magnitudes to be able to resolve very small signals across the whole bandwidth (as defined as DC through 30Hz). It is also critical for Applicants to sample at 200 to 1000 samples per second to capture the short duration of the small magnitude signals. In contrast, McEachern, et al., sample at a rate of 25 samples per second, which is insufficient for Applicants' claimed invention. (*See* column 3, line 25.) Since McEachern, et al., are not directed to such low signals, the omission of an amplifier does not deter operation of the overall apparatus. One of ordinary skill in the art would find no motivation in McEachern, et al., to modify the Applicants' apparatus to preclude utilizing an amplifier, as doing so would render Applicants' collapse system inoperable.

4. Applicants respectfully disagree with Examiner's assertion that Applicants' use of a thermal casing (that McEachern, et al., does not possess) is merely a design consideration and obvious over McEachern, et al.,

Applicants contend that the thermal casing is a necessary component of Applicants' device, as it is to be used in situations where readings are being taken under severe environmental conditions and transmitted to a remote location. Given the need to ensure accurate and precise readings by the accelerometer, it is thus imperative to guard against any and all possible environmental hazards that would affect the collection of data. As a result, Applicants' device claims a thermal casing to protect against damage resulting from high temperatures surrounding the accelerometer apparatus; failure to include said casing would render the collapse system inoperable.

On the other hand, McEachern, et al., is drawn to uses as a resonance mechanism where environmental conditions will not be as severe as those considered by Applicants' technology, thereby negating the need for a thermal casing. Even in the traumatic events that McEachern, et al., contemplate, such as an earthquake, explosion or hurricane, the main concern would be physical destruction, not thermal destruction, again rendering a thermal casing unnecessary. Thus, one of ordinary skill would not find the thermal casing obvious over McEachern, et al.

5. Applicants respectfully disagree with Examiner's assertion that it would be obvious to provide McEachern, et al., with an accelerometer that monitors a burning structure (similar to that employed by Applicants) so that the McEachern, et al., device could operate in the same fashion as Applicants'.

To reiterate, McEachern, et al., are directed to the detection of resonant accelerations over a long period of time to indicate possible hidden structural damage. Applicants' system

monitors a collapse mechanism that is intended to detect immediate damage over a much shorter period of time. In order for one of ordinary skill in the art to find the Applicants' accelerometer obvious over McEachern, et al., the accelerometer used by McEachern, et al., would have to account for near-zero and over 10 Hz. frequencies. McEachern, et al., fails to do so as discussed above. Alternatively, Applicants would have to modify their system to utilize McEachern, et al.'s, accelerometer. This would render the Applicants' system inoperable, as discussed above. Thus, in order for each apparatus to operate as intended, McEachern, et al., must incorporate an accelerometer that melds with a resonance mechanism, and Applicants, et al., must incorporate an accelerometer that melds with a collapse mechanism. The difference in their respective utilities would motivate one of ordinary skill not to make the modification.

It is for the reasons discussed above that Applicants' claimed invention is distinguished from McEachern, et al. Thus, it is the Applicants' position that the above arguments overcome the Examiner's rejections. Applicants, therefore, respectfully request that the claims be placed in condition for allowance at the earliest.

Please direct any questions or comments to Abanti B. Singla, Esq., at (410) 964-9553.

Respectfully submitted,.

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Date

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